

Practice: 398 - Fish Raceway or Tank**Scenario:** #1 - Fish Raceway-Single

Scenario Description: The construction of a concrete fish raceway to facilitate the collection of wastes, the containment of cultured fish, and to maintain water quality. Typical practice is a 100' long x 6' wide x 3.5' deep concrete raceway with a quiescent zone for waste collection and sloped floors as per the conservation practice standard. This scenario includes all necessary labor and materials for excavation, aggregate, cast-in-place concrete, fish screens, weir boards, and concrete sealing with epoxy paint.

Before Situation: In the before situation, an aquaculture producer has an aquaculture production system with one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation: Fish raceway is typically 2,100 cubic feet in size (100'x6'x3.5') with 0.8' thick slab and 0.8' thick walls of cast in place, reinforced concrete. The practice is installed using a hydraulic excavator, and concrete pump truck. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Inlets and outlets, if needed will be installed using Structure for Water Control (587). Pipeline, Pumping Plant, Water Well, and Access Roads may also be needed and will be installed using those standards as appropriate.

Scenario Feature Measure: Cubic Foot of Raceway**Scenario Unit:** Cubic Foot**Scenario Typical Size:** 2100**Total Scenario Cost:** \$47,766.87**Scenario Cost/Unit:** \$22.75**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$511.29	52	\$26,587.08
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$4.31	862	\$3,715.19
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.58	284	\$731.70
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$44.50	16	\$712.06
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hour	\$187.31	24	\$4,495.55

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$36.06	47	\$1,694.91
Dimension Lumber, untreated	1045	Untreated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners.	Board Foot	\$0.82	54	\$44.35
Fish Screen, Welded Stainless Steel	2059	Stainless Steel Fish Screen. Includes materials and shipping only.	Each	\$2,053.03	2	\$4,106.06
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	\$0.91	1342	\$1,225.18

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$25.96	16	\$415.33
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer,	Hour	\$26.15	40	\$1,046.08

		herder, concrete placement, materials spreader, flagger, etc.				
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	12	\$506.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.61	40	\$1,744.47

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$487.39	1	\$487.39
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	1	\$255.27

Practice: 398 - Fish Raceway or Tank

Scenario: #2 - Fish Raceway-Parallel

Scenario Description: The construction of a concrete fish raceway to facilitate the collection of wastes, the containment of cultured fish, and to maintain water quality. Typical practice is side by side 100' long x 6' wide x 3.5' deep concrete raceway with a quiescent zone for waste collection and sloped floors as per the conservation practice standard. This scenario includes all necessary labor and materials for excavation, aggregate, cast-in-place concrete, fish screens, weir boards, and concrete sealing with epoxy paint.

Before Situation: In the before situation, an aquaculture producer has an aquaculture production system with one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation: Fish raceway is typically 4,480 cubic feet in size (100'x12.8'x3.5') with 0.8' thick slab and 0.8' thick walls of cast in place, reinforced concrete. The practice is installed using a hydraulic excavator, and concrete pump truck. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Inlets and outlets, if needed will be installed using Structure for Water Control (587). Pipeline, Pumping Plant, Water Well, and Access Roads may also be needed and will be installed using those standards as appropriate.

Scenario Feature Measure: Cubic Foot of Fish Raceway

Scenario Unit: Cubic Foot

Scenario Typical Size: 4480

Total Scenario Cost: \$75,508.45

Scenario Cost/Unit: \$16.85

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$511.29	87	\$44,482.23
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$4.31	1056	\$4,551.32
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.58	374	\$963.57
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$44.50	24	\$1,068.09
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hour	\$187.31	24	\$4,495.55

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$36.06	73	\$2,632.52
Dimension Lumber, untreated	1045	Untreated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners.	Board Foot	\$0.82	108	\$88.71
Fish Screen, Welded Stainless Steel	2059	Stainless Steel Fish Screen. Includes materials and shipping only.	Each	\$2,053.03	4	\$8,212.11
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	\$0.91	2684	\$2,450.36

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$25.96	24	\$622.99
General Labor	231	Labor performed using basic tools such as power tool, shovels, and	Hour	\$26.15	60	\$1,569.12

		other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.				
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	24	\$1,012.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.61	60	\$2,616.71

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$487.39	1	\$487.39
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	1	\$255.27